

Uranium forms in Baikal basin

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Vertical profiles of uranium in sediment of Lake Baikal looked correlative with paleoclimatic indicators (for example, a temperature record obtained from delta D in Vostok ice core). Many researchers suggested that vertical profiles of uranium in sediment of Lake Baikal could be a paleoclimatic indicator. But it is not well investigated why uranium profile behaves like as a paleoclimatic indicator. In this study, we measured bulk concentration of uranium in soils and concentration in five forms of uranium that extracted by five different reagents in soils and sediments of Baikal basin.

Two soil samples used here were uranium-rich, which were collected in Serenga basin. Sediment samples were handled from uranium-rich portion and uranium-poor portion in BDP93-2 and BDP96-1 cores. It seems that sediments in BDP93-2 are more affected by the inputting river than those in BDP96-1. Bulk uranium concentration in soils was measured, and uranium concentration of each form (Exchangeable, Carbonate, Fe,Mn-Oxide, Organic and Residue) in both soils and sediments were measured after sequential extraction procedure (Tessier et al., 1979). Uranium was measured with ICP-MS.

In soil samples, uranium was more abundant (point1 : 9.2-29.5 ppm, point2 : 32.2-176.2 ppm) than in other region, and accumulated more in the upper layer of the soil. Uranium concentration in layer A and B was higher than in layer C. The majority of uranium in layer A and B was extracted as Carbonate, Fe,Mn-Oxide and Organic, and in layer C it was extracted more in Mineral. Therefore it was suggested that the migration of uranium occurred by the gradient of uranium concentration in the interstitial water, because adsorbent such as carbonates and oxides increased in upper layers by pedogenic process and weathering.

In sediment samples, extracted uranium in uranium-rich portions was abundant in Carbonate, Fe,Mn-Oxide and Organic in comparison with that in uranium-poor portions. Especially Carbonate uranium in BDP96-1 was higher than that in BDP93-2. Thus it was thought that the sedimentational pass of uranium was changed by the climatic change of glacial-interglacial periods and the effect of inputting river.